

Listing of the Claims:

1. (currently amended): A material for absorbing biological fluids, comprising a flexible substrate and an enhanced surface, said enhanced surface comprising a polymer of antimicrobial monomeric moieties comprising a quaternary ammonium structure or a biguanide, said polymer being covalently bonded by non-siloxane bonds to said flexible substrate so as to be non-hydrolyzable and non-leachable and wherein a sufficient amount of said non-hydrolyzable, non-leachable polymer is covalently bonded to said flexible substrate to render the material antimicrobial when exposed to aqueous fluids, menses, bodily fluids, or wound exudates.
2. (currently amended): The material of claim 1, wherein said antimicrobial monomeric moieties comprise at least one quaternary ammonium structure.
3. (canceled)
4. (currently amended): The material of claim ~~3~~ 1, wherein said antimicrobial monomeric moieties ~~at least one non-ionic structure comprises~~ comprise a biguanide.
5. (previously presented): The material of claim 1, wherein said non-hydrolyzable, non-leaching polymer has an average degree of polymerization of about 10 to 100.
6. (previously presented): The material of claim 1, wherein said material comprises all or part of a wound dressing, sanitary pad, a tampon, an intrinsically antimicrobial absorbent dressing, a diaper, toilet paper, a sponge, a sanitary wipe, isolation and surgical gowns, gloves, surgical scrubs, sutures, sterile packaging, floor mats, lamp handle covers, burn dressings, gauze rolls, blood transfer tubing or storage container, mattress cover, bedding, sheet, towel, underwear, socks, cotton swabs, applicators, exam table covers, head covers, cast liners, paddings, lab coats, air filters for autos planes or HVAC systems, military protective garments, face masks, devices for protection against biohazards and biological warfare agents, meat or fish packaging material, apparel for food handling, or paper currency.
7. (original): The material of claim 1, wherein said flexible substrate is comprised, in whole or in part, of cellulose, or other naturally-derived polymers.

8. (previously presented): The material of claim 1 wherein said flexible substrate is comprised, in whole or in part, of synthetic polymers.

9. (original): The material of claim 1, wherein said attachment of said non-hydrolyzable, non-leachable polymer to said flexible substrate is via a carbon-oxygen-carbon bond, also known as an ether linkage.

10. (original): The material of claim 9, wherein a cerium-containing catalyst catalyzes formation of said ether linkage.

11. (previously presented): The material of claim 1 wherein said non-hydrolyzable, non-leachable polymer was formed by polymerization of allyl- or vinyl-containing monomers.

12. (currently amended): The material of claim 11 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: styrene derivatives; allyl amines or ammonium salts.

13. (currently amended): The material of claim 11 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: acrylates, methacrylates, acrylamides, and methacrylamides.

14. (currently amended): The material of claim 13 wherein said allyl- or vinyl-containing monomers are selected from the group consisting of: compounds of the structure  $\text{CH}_2=\text{CR}-(\text{C}=\text{O})-\text{X}-(\text{CH}_2)_n-\text{N}^+\text{R}'\text{R}''\text{R}'''/\text{Y}^-$ ; wherein, R is hydrogen or methyl, n equals 2 or 3, X is either O, S, or NH, R', R'', and R''' are independently selected from the group consisting of H, C1 to C16 alkyl, aryl, arylamine, alkaryl, and aralkyl, and Y<sup>-</sup> is an acceptable anionic counterion to the positive charge of the quaternary nitrogen; diallyldialkylammonium salts; vinyl pyridine and salts thereof; and vinylbenzyltrialkylammonium salts.

15. (original): The material of claim 14 where said allyl- or vinyl-containing monomers are selected from the group consisting of: dimethylaminoethyl methacrylate:methyl chloride quaternary; and dimethylaminoethyl methacrylate:benzyl chloride quaternary.

16. (currently amended): A superabsorbent material for absorbing biological fluids, comprising a flexible substrate and an enhanced surface, said enhanced surface comprising polymer of antimicrobial monomeric moieties comprising a quaternary ammonium structure or a biguanide, said polymer being covalently bonded by non-siloxane bonds to said flexible substrate so as to be non-hydrolyzable and non-leachable; and wherein a sufficient amount of said non-hydrolyzable, non-leachable polymer is covalently bonded to said flexible substrate to render the material antimicrobial when exposed to aqueous fluids, menses, bodily fluids, or wound exudates; wherein said superabsorbent material is capable of absorbing about 30 or more times its own weight of water or other fluids in a single instance; and wherein said absorbing capacity is the result of branching or crosslinking of said non-hydrolyzable, non-leachable polymer.

17. (currently amended): The material of claim 16, wherein said antimicrobial monomeric moieties comprise at least one quaternary ammonium structure.

18. (canceled).

19. (currently amended): The material of claim ~~48~~ 16, wherein said antimicrobial monomeric moieties ~~at least one non-ionic structure comprises~~ comprise a biguanide.

20. (previously presented): The material of claim 16, wherein said material comprises all or part of a wound dressing, sanitary pad, a tampon, an intrinsically antimicrobial absorbent dressing, a diaper, toilet paper, a sponge, a sanitary wipe, burn dressings, gauze rolls, mattress cover, bedding, sheet, towel, underwear, socks, cotton swabs, applicators, exam table covers, head covers, cast liners, paddings, lab coats, air filters for autos planes or HVAC systems, military protective garments, face masks, devices for protection against biohazards and biological warfare agents, ~~lumber~~, meat packaging material, or paper currency.

21. (original): The material of claim 16, wherein said flexible substrate is comprised, in whole or in part, of cellulose, or other naturally-derived polymers.

22. (previously presented): The material of claim 16 wherein said flexible substrate is comprised,

in whole or in part, of synthetic polymers.

23. (original): The material of claim 16, wherein said attachment of said non-hydrolyzable, non-leachable polymer to said flexible substrate is via a carbon-oxygen-carbon bond, also known as an ether linkage.

24. (original): The material of claim 23, wherein a cerium-containing catalyst catalyzes formation of said ether linkage.

25. (previously presented): The material of claim 16 wherein said non-hydrolyzable, non-leachable polymer was formed by polymerization of allyl- or vinyl-containing monomers.

26. (currently amended): The material of claim 25 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: styrene derivatives; allyl amines or ammonium salts.

27. (currently amended): The material of claim 25 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: acrylates, methacrylates, acrylamides, and methacrylamides.

28. (previously presented): The material of claim 27 wherein said allyl- or vinyl-containing monomers are selected from the group consisting of: compounds of the structure  $\text{CH}_2=\text{CR}-(\text{C}=\text{O})-\text{X}-(\text{CH}_2)_n-\text{N}^+\text{R}'\text{R}''\text{R}'''//\text{Y}^-$ ; wherein, R is hydrogen or methyl, n equals 2 or 3, X is either O, S, or NH, R', R'', and R''' are independently selected from the group consisting of H, C1 to C16 alkyl, aryl, arylamine, alkaryl, and aralkyl, and Y<sup>-</sup> is an acceptable anionic counterion to the positive charge of the quaternary nitrogen; dialkyltrialkylammonium salts; vinyl pyridine and salts thereof; and vinylbenzyltrialkylammonium salts.

29. (original): The material of claim 28 where said allyl- or vinyl-containing monomers are selected from the group consisting of: dimethylaminoethyl methacrylate:methyl chloride quaternary; and dimethylaminoethyl methacrylate:benzyl chloride quaternary.

30. (currently amended): An inherently antimicrobial composition comprising:

a. a substrate; and,

b. a coating, layer, or enhanced surface area on said substrate, comprised of a plurality of polymeric molecules of ~~variable lengths bearing a polymer of~~ antimicrobial ~~monomeric moieties~~groups comprising a quaternary ammonium structure or a biguanide, wherein said ~~polymeric~~ molecules are covalently, non-leachably bound to said substrate, and wherein said coating, layer, or enhanced surface area exhibits antimicrobial activity due to the presence of said polymer of antimicrobial monomeric moieties~~groups~~.

31. (currently amended): The composition of claim 30, wherein said antimicrobial monomeric moieties ~~groups~~ comprise at least one quaternary ammonium structure.

32. (canceled).

33. (currently amended): The composition of claim ~~32~~ 30, wherein said antimicrobial monomeric moieties ~~at least one non-ionic structure~~ comprises a biguanide.

34. (previously presented): The composition of claim 30, wherein said material comprises all or part of a wound dressing, sanitary pad, a tampon, an intrinsically antimicrobial absorbent dressing, a diaper, toilet paper, a sponge, a sanitary wipe, food preparation surfaces, gowns, gloves, surgical scrubs, sutures, needles, sterile packings, floor mats, lamp handle covers, burn dressings, gauze rolls, blood transfer tubing or storage container, mattress cover, bedding, sheet, towel, underwear, socks, cotton swabs, applicators, exam table covers, head covers, cast liners, splint, paddings, lab coats, air filters for autos planes or HVAC systems, military protective garments, face masks, devices for protection against biohazards and biological warfare agents, lumber, meat packaging material, or paper currency.

35. (original): The composition of claim 30, wherein said flexible substrate is comprised, in whole or in part, of cellulose, or other naturally-derived polymers.

36. (original): The composition of claim 30 wherein said flexible substrate is comprised, in whole or in part, of synthetic polymers including, but not limited to: polyethylene, polypropylene, nylon, polyester, polyurethane, or silicone.

37. (original): The composition of claim 30, wherein said attachment of said non-hydrolyzable, non-leachable polymer to said flexible substrate is via a carbon-oxygen-carbon bond, also known as an ether linkage.

38. (original): The composition of claim 37, wherein a cerium-containing catalyst catalyzes formation of said ether linkage.

39. (original): The composition of claim 30 wherein said non-hydrolyzable, non-leachable polymer chains are formed by polymerization of allyl- or vinyl-containing monomers.

40. (currently amended): The composition of claim 39 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: styrene derivatives; allyl amines or ammonium salts.

41. (currently amended): The composition of claim 39 wherein said allyl- or vinyl-monomers are selected from [[a]] the group consisting of: acrylates, methacrylates, acrylamides, and methacrylamides.

42. (previously presented): The composition of claim 41 wherein said allyl- or vinyl-containing monomers are selected from the group consisting of: compounds of the structure  $\text{CH}_2=\text{CR}-(\text{C}=\text{O})-\text{X}-(\text{CH}_2)_n-\text{N}^+\text{R}'\text{R}''\text{R}'''//\text{Y}^-$ ; wherein, R is hydrogen or methyl, n equals 2 or 3, X is either O, S, or NH, R', R'', and R''' are independently selected from the group consisting of H, C1 to C16 alkyl, aryl, arylamine, alkaryl, and aralkyl, and Y<sup>-</sup> is an acceptable anionic counterion to the positive charge of the quaternary nitrogen; diallyldialkylammonium salts; vinyl pyridine and salts thereof; and vinylbenzyltrialkylammonium salts.

43. (original): The composition of claim 42 where said allyl- or vinyl-containing monomers are selected from the group consisting of: dimethylaminoethyl methacrylate:methyl chloride quaternary; and dimethylaminoethyl methacrylate:benzyl chloride quaternary.

44. (original): The antimicrobial composition of claim 43, wherein said substrate is a woven or nonwoven flexible matrix, and said composition is formed into the shape of a wound dressing.

45. (original): The antimicrobial composition of claim 43, wherein said coating absorbs aqueous liquids.

46. (original): The antimicrobial composition of claim 43, wherein said substrate is wood, lumber, or an extract comprising or a derivative of wood fiber.

47-50. (canceled)

51. (original): An antimicrobial-coated composition for destruction of microbes contacting said composition, comprising:

- a. a substrate onto which a coating of antimicrobial polymers is bonded; and,
- b. said coating, formed of an effective amount of polymeric molecules having a multiplicity of quaternary ammonium groups, wherein said polymeric molecules are non-leachably and covalently bonded to surface sites of said substrate, wherein said polymers do not form using siloxane bonds, and wherein said coating is absorbent of aqueous liquids, whereby said multiplicity of quaternary ammonium groups act to destroy microbes coming in contact with said groups.

52. (previously presented): The material of claim 1, wherein said antimicrobial monomeric moieties are bound to one another via covalent chemical bonds selected from the group consisting of carbon-carbon bonds, carbon-oxygen bonds, and carbon-nitrogen bonds.

53. (previously presented): The material of claim 1, wherein said flexible substrate is a woven fabric.

54. (previously presented): The material of claim 1, wherein said antimicrobial monomeric moieties comprise dimethyldiallylammonium chloride, also known as DADMAC.

55. (previously presented): The material of claim 1, wherein said material further comprises an indicator that indicates a condition or status based on an aspect of said absorbed biological fluids.

56. (previously presented): The material of claim 1, wherein said material further comprises a hemostatic agent.

57. (previously presented): The material of claim 8, wherein said flexible substrate is polyethylene, polypropylene, nylon, polyester, polyurethane, or silicone.
58. (previously presented): The material of claim 8, wherein said flexible substrate is a nonwoven.
59. (previously presented): The material of claim 16, wherein said antimicrobial monomeric moieties are bound to one another via covalent chemical bonds selected from the group consisting of carbon-carbon bonds, carbon-oxygen bonds, and carbon-nitrogen bonds.
60. (previously presented): The material of claim 16, wherein said flexible substrate is a woven fabric.
61. (previously presented): The material of claim 16, wherein said antimicrobial monomeric moieties comprise dimethyldiallylammonium chloride, also known as DADMAC.
62. (previously presented): The material of claim 16, wherein said material further comprises an indicator that indicates a condition or status based on an aspect of said absorbed biological fluids.
63. (previously presented): The material of claim 16, wherein said material further comprises a hemostatic agent.
64. (previously presented): The material of claim 22, wherein said flexible substrate is polyethylene, polypropylene, nylon, polyester, polyurethane, or silicone.
65. (previously presented): The material of claim 22, wherein said flexible substrate is a nonwoven.
66. (previously presented): The composition of claim 30, wherein said antimicrobial monomeric moieties are bound to one another via covalent chemical bonds selected from the group consisting of carbon-carbon bonds, carbon-oxygen bonds, and carbon-nitrogen bonds.
67. (previously presented): The composition of claim 30, wherein said antimicrobial monomeric moieties comprise dimethyldiallylammonium chloride, also known as DADMAC.
68. (previously presented): The composition of claim 30, wherein said substrate is a woven fabric.



69. (previously presented): The composition of claim 30, wherein said substrate is a nonwoven.